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The Social Support–Health Link Unraveled: Pathways Linking Social Support to Functional Capacity in Later Life

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Abstract

Objective: Despite evidence that social support is strongly related to health, very little is known about the mechanisms underlying this association. This study investigates whether physical activity, depressive symptoms, and chronic diseases mediate the associations between social support and functional capacity. **Method:** Data from the Longitudinal Aging Study Amsterdam on 954 participants, aged 75 and older, covering 9 years, are analyzed with latent growth mediation models. **Results:** Only the indirect path from the initial level of emotional support to the initial level of functional capacity through the initial level of depressive symptoms was significant. All mediators however were significantly associated with the level of and changes in functional capacity. Models with reversed pathways were estimated, but model fit was worse. **Discussion:** Because only initial levels of social support relate to functional capacity, and changes in social support do not, older adults likely receive the support they need.

Keywords

social support, physical function, mental health, physical activity, chronic conditions

Introduction

Over the past decades, findings that social support is strongly associated with health and mortality have accumulated. Social support as a function of the social network has been linked to mortality (Holt-Lunstad, Smith, Baker, Harris, & Stephenson, 2015) and health status (Cornwell & Waite, 2009; Thoits, 2011). Despite the overwhelming evidence about the social network–health association, still very little is known about *how* social relations influence health (Thoits, 2011), including functional capacity. Research on the mechanisms in the social support–functional capacity link is most imperative when people have an increased need for social ties and the social support received from these ties, such as in old age (Ashida & Heaney, 2009). Low functional capacity is one of the strongest health predictors of informal and formal care use in old age (Paraponaris, Davin, & Verger, 2012), as well as institutionalization (Von Bonsdorff, Rantanen, Laukkanen, Suutama, & Heikkinen, 2006). Most studies on the social network–functional capacity link are based on cross-sectional data or cover a relatively short time period (e.g., Everard, Lach, Fisher, & Baum, 2000; Seeman, Bruce, & McAvay, 1996). These studies therefore do not capture the dynamic processes in which social support received from a person's social network and their health interact over time. In the present study, we therefore empirically investigate mechanisms in the relationship between social support and functional capacity.

Berkman, Glass, Brissette, and Seeman (2000) proposed that social support influences health outcomes through three pathways: (a) stimulating health-promoting behavior, (b) stimulating psychological well-being, and (c) improving physiological posture. In the present study, we investigate physical activity, depressive symptoms, and chronic diseases as potential mediators that represent each of the three respective pathways. Physical activity, depressive symptoms, and chronic diseases are by no means the only conceivable mediating mechanisms in the social support–functional capacity link. Hence, we do not expect complete mediation. We employ data from four waves of

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the nationally representative Longitudinal Aging Study Amsterdam (LASA). LASA is a multidisciplinary study investigating the physical, cognitive, emotional, and social functioning of the (Dutch) older population. For the present study, we employ data from older adults aged 75 years and over, who were followed over a time span of 9 years.

Social Support and Functional Capacity

Social support typically refers to the functions that others perform for an individual. Social support is often divided further into different types of support, such as instrumental and emotional support (Thoits, 2011). Instrumental support is help with tangible needs, such as getting groceries, cleaning, or paying bills. Emotional support includes displays of love, care, and sympathy that people receive from others. In the current study, we measure functional capacity by one's ability to engage in activities of daily living (ADLs; Katz, Ford, Moskowitz, Jackson, & Jaffe, 1963). So far, the handful of studies on the association between social support and functional capacity do not show a uniformly positive influence of social support. In a longitudinal study, Mendes de Leon, Gold, Glass, Kaplan, and George (2001) found that receiving instrumental support is associated with an increased risk of ADL limitations over a period of 7 years. Receiving emotional support had no significant association with ADL limitations, but when controlled for instrumental support, emotional support had a beneficial effect on ADL limitations. Seeman et al. (1996) also established that a greater frequency of instrumental support significantly increased the 2.5-year risk of onset or recurrent ADL disability among men, and a similar yet not significant finding was seen among women. No significant associations between received emotional support and ADL disability were found. Everard and colleagues (2000) found no association between received emotional and instrumental support and functional capacity among adults aged 65 to 89 in a cross-sectional study. Earlier findings thus suggest that the type of received social support plays a critical role. A positive effect of receiving emotional support on functional capacity is often expected, as it may enhance people's feelings of being able to handle ADLs (Thoits, 2011), and promote recovery from disability by, for example, bolstering self-efficacy (Mendes de Leon et al., 2001). However, as stated before, empirical findings on the effects of received emotional support are mixed. Several explanations have been put forward in the literature as to why receiving more instrumental support is associated with lower functional capacity. Receiving more instrumental support could be an indication of preclinical disability and related to a higher need for tangible support (Mendes de Leon et al., 2001). Receiving instrumental support might thus be an indicator of need. Also, the greater reliance on others could result in reductions in perceived abilities to perform ADLs over time, because of an actual, decreased ability or increased feelings of dependence and a lack of autonomy (Seeman et al., 1996). We expect the following direct effects:

Hypothesis 1A: Receiving more emotional support is associated with better functional capacity in old age (intercept effect), and an increase in emotional support is associated with an increase in functional capacity (slope effect).

Hypothesis 1B: Receiving more instrumental support is associated with lower functional capacity, and an increase in instrumental support is associated with a decrease in functional capacity.

Below we describe in more detail three potential pathways, that is, physical activity, depressive symptoms, and chronic diseases, by which received social support can influence functional capacity.

Pathways From Social Support to Functional Capacity

Health Behavioral Pathway: Physical Activity

Multiple studies have found that greater social support from the network has positive direct effects on health behaviors, such as physical activity (e.g., Emmons, Barbeau, Gutheil, Stryker, & Stoddard, 2007; Everard et al., 2000). These studies have used more general social network and support measures and did not distinguish between received emotional and instrumental support. In the literature, two mechanisms have been proposed by which receiving social support stimulates health-promoting behaviors. First, social influence theory (Marsden & Friedkin, 1993) holds that individuals assess the appropriateness of their own beliefs, attitudes, and behaviors toward health behavior against what is asserted and exhibited by members of their reference group, to whom they shift their attitudes and behavior. If members of the reference group are supportive of good health behavior, it is likely that people adopt good health behaviors. Second, the social control inherent in social support may result in attempts to monitor, encourage, remind, or pressure a person to adopt or adhere to positive health behavior (Berkman et al., 2000; Thoits, 2011). Again, a protective effect of received social support is more likely from emotional support. For example, providing encouragement and discussing health beliefs are more characteristic of emotional support than instrumental support. If older adults receive more instrumental support, their physical activity could decrease as they rely more on others to do tasks for them. Physical activity is assumed to have a beneficial effect in the disablement process (Jette, 2009) by slowing the decline in functional capacity. A lack of physical activity in older adults is therefore a well-known risk factor of decreases in functional capacity among older adults over time (Motl & McAuley, 2010). Evidence of the total indirect effect of social support via physical activity on

functional capacity is not yet available from the literature. Based on the available empirical findings and mechanisms discussed here, we expect the following:

Hypothesis 2A: Receiving more emotional support is associated with more physical activity, which is associated with better functional capacity in old age (intercept effect), and an increase in emotional support is associated with an increase in physical activity, which is associated with an increase in functional capacity (slope effect).
Hypothesis 2B: Receiving more instrumental support is associated with less physical activity, which is associated with worse functional capacity in old age, and an increase in instrumental support is associated with a decrease in physical activity, which is associated with a decrease in functional capacity.

Psychological Pathway: Depressive Symptoms

The second pathway that links social support to health could be through emotional states, such as depressive symptoms. Depressive symptoms include feelings of sadness, worthlessness, irritability, and loss of interests. Receiving higher levels of emotional support is predictive of lower depressive symptoms among older adults (Cornwell & Waite, 2009; Reinhardt, Boerner, & Horowitz, 2006). Emotional support can make people feel cared for and valued. Reinhardt and colleagues (2006) found that greater instrumental support increased depressive symptoms among older adults. Thus, although people might feel that they need help with tangible tasks, they might not feel good about receiving it. In two longitudinal studies on older adults (Carbonare et al., 2009; Penninx, Leveille, Ferrucci, van Eijk, & Guralnik, 1999), a positive association between depressive symptoms and (the onset of) disability (measured as ADL limitations) was found. The feelings of sadness and helplessness associated with depression are likely to result in less attention for medical and health issues and might also be an early indicator of medical conditions that affect functional capacity (Penninx, Leveille, et al., 1999). Alternatively, the feelings of sadness and worthlessness that accompany depression could result in an underestimation of actual functional abilities (Alschuler, Theisen-Goodvich, Haig, & Geisser, 2008). Based on previous findings and explicated mechanisms, we expect the following:

Hypothesis 3A: Receiving more emotional support is associated with fewer depressive symptoms, which is associated with better functional capacity in old age (intercept effect), and an increase in emotional support is associated with a decrease in depressive symptoms, which is associated with an increase in functional capacity (slope effect).
Hypothesis 3B: Receiving more instrumental support is associated with more depressive symptoms, which is associated with worse functional capacity in old age, and an increase in instrumental support is associated with an increase in depressive symptoms, which is associated with a decrease in functional capacity.

Physiological Pathway: Chronic Diseases

The third pathway by which social support can influence functional capacity is through physiological posture. Receiving social support has been related to better functioning in various physiological systems, including cardiovascular, neuroendocrine, and immune functions (Cacioppo, Hawkley, & Thisted, 2010). Receiving more emotional support is associated with having fewer chronic diseases among older adults, such as diabetes, arthritis, asthma, emphysema, and hypertension (Tomaka, Thompson, & Palacios, 2006). A review of the literature on social support and physiological functioning also concluded that receiving more social support results in lower levels of cortisol and better immune systems, as well as better adaptation to impaired psychological functioning and chronic diseases once they surface (Uchino, 2006). Receiving high levels of instrumental support could be an indicator of higher need due to the onset of certain chronic conditions (Penninx, Van Tilburg, et al., 1999b). Receiving more instrumental support is thus likely to be positively associated with the development of chronic diseases. In the disablement process model (Jette, 2009), chronic diseases decrease functional capacity through dysfunctions and structural abnormalities in certain body systems. Stenholm and colleagues (2014) found that older adults who have more chronic diseases have worse trajectories in difficulties with ADLs. Based on the mechanisms discussed, we expect the following:

Hypothesis 4A: Receiving more emotional support is associated with having fewer chronic diseases, which is associated with better functional capacity in old age (intercept effect), and an increase in emotional support is associated with a decrease in chronic diseases, which is associated with an increase in functional capacity (slope effect).
Hypothesis 4B: Receiving more instrumental support is associated with having more chronic diseases, which is associated with worse functional capacity in old age, and an increase in instrumental support is associated with an increase in chronic diseases, which is associated with a decrease in functional capacity.

Method

Sample

Data were taken from LASA, a longitudinal and multidisciplinary research program focused on the physical, cognitive, social, and emotional functioning of older adults aged 55 and above (Huisman et al., 2011). This program employed

stratified random samples of men and women born between 1908 and 1957. The oldest participants, particularly the oldest men, were intentionally overrepresented in the sample. The LASA sample was drawn from the population registers of 11 municipalities that vary in religious climate and level of urbanization. A total of 3,107 respondents born between 1908 and 1937 took part in the first LASA observation (1992-1993, T_1). The response rate was 63%. Since 1992/1993, data have been collected every 3 years using the same face-to-face interviews and self-administered questionnaires. For the present study, we used data from the 1992 wave and three follow-up observations conducted in 1995-1996 (T_2, N = 2,545), 1998-1999 (T_3, N = 2,076), and 2001-2002 (T_4, N = 1,691). Additional information on the LASA cohort study (Huisman et al., 2011) and recent findings within the study (Hoogendijk et al., 2016) can be obtained elsewhere. We selected adults in the fourth life phase, aged 75 years and above. Studying this age group across more than four waves of data would result in a rather low covariance coverage, as attrition increases strongly after these 9 years. Respondents who provided valid data on only one observation were included in the analyses, as excluding these respondents would bias the intercept. In total, we have valid data on 954 individuals. At T1, we have valid data on 954 respondents, at T2 on 561 respondents, at T3 on 321 respondents, and at T4 on 174 respondents. For each follow-up, on average 57% was reinterviewed, 21% had died, 2% were too ill or too cognitively impaired to be interviewed, 1% refused to be interviewed, and less than 1% could not be interviewed due to a residential relocation to another country or an unknown destination. Also, on average for each follow-up, 4% was excluded because of missing data due to the use of an abridged version of the questionnaire, 2% because the interview was terminated prematurely or item nonresponse, 5% had a phone interview, 4% had a proxy phone interview, and 4% became institutionalized. From observation to observation, we had an increasingly selective sample composition. By means of logistic regression analyses, across the four observations, respondents who died have been compared with respondents with follow-up data. Those who have follow-up data have a better functional capacity (odds ratio [OR] = 1.12, Wald = 78.9, $p < .001$) than those who died. They are also younger (OR = .93, Wald = 33.3, $p < .001$), more often female (OR = 1.94, Wald = 28.9, $p < .001$), and have less chronic diseases (OR = .72, Wald = 39.9, $p < .001$). No other differences between those who died and who have follow-up data were found. Also, we investigated differences between those who drop out for any other reason than mortality and those with follow-up data. Those with follow-up data have a better functional capacity (OR = 1.07, Wald = 32.7, $p < .001$) compared with those who drop out for any other reason than mortality. They are also younger (OR = .90, Wald = 33.3, $p < .001$), more often female (OR = 1.94, Wald = 28.9, $p < .001$), have less depressive symptoms (OR = .96, Wald = 22.2, $p < .001$), and have less chronic diseases (OR = .72, Wald = 39.9, $p < .001$). No other differences between those who drop out due to any other reason than mortality and those who have follow-up data have been found.

Measures

We measured functional capacities with six questions about ADLs, based on Katz and colleagues (1963). These are "Can you walk up and down stairs?" "Can you use your own or public transportation?" "Can you cut your own toenails?" "Can you dress and undress yourself?" "Can you sit down and stand up from a chair?" and "Can you walk outdoors for five minutes without stopping?" The five possible answers were 1 = not at all, 2 = only with help, 3 = with a great deal of difficulty, 4 = with some difficulty, and 5 = without difficulty. Item scores were summed to obtain a scale score ranging from 6 (*poor*) to 30 (*good*).

Emotional and instrumental support received from others was measured with a number of questions on the personal network. In LASA, a domain-specific approach for network delineation was employed. The following classification of personal relationships was utilized: household members, children and their partners, other family members, neighbors, contacts through work (including voluntary work) and school, members of associations (e.g., athletic clubs, church, political parties), and other nonkin relationships. For each of the seven domains, the following question was asked: "Name the people you have frequent contact with and who are also important to you" (Van Tilburg, 1998). The criteria of "important" were left to the interpretation of the respondent, and only persons older than 18 could be considered network members. The identification method was the same across all observations. For the nine most frequently contacted people—other than the partner—participants were asked how much social support they received. For emotional support, they were asked "How often in the past year did you talk to [name] about your personal experiences and feelings?" For instrumental support they were asked "How often in the past year did [name] help you with daily tasks in and around the house?" Response categories range from 1 = *never* to 4 = *often*. Scores for emotional and instrumental support were summed across all answers, ranging from 0 (*no support received*) to 36 (*maximum score on received support*). If no relationship other than the partner was identified in the personal network, a score of zero was assigned.

To assess physical activity, respondents were asked how often and for how long in the previous 2 weeks they had engaged in walking, bicycling, light and heavy household activities, sports, and gardening. The time spent on total physical activity (in minutes/day) was calculated by multiplying the frequency and duration of each activity in the previous 2 weeks, summing the values across activities, and dividing by 14. Depressive symptoms were measured with the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977). The CES-D is a self-report scale designed

to measure depressive symptoms in the general population. The items were chosen to represent depressive symptoms common in the community. The scale consists of 20 items covering depressive symptomatology experienced in the past week. The total score of the 20 items ranges from 0 to 60, and higher scores indicate more depressive symptoms. The number of self-reported chronic diseases was counted from 0 to 7. The seven chronic conditions counted were (a) chronic nonspecific lung disease, (b) cardiac disease, (c) peripheral arterial disease, (d) diabetes mellitus, (e) cerebrovascular accident or stroke, (f) arthritis, and (g) malignancies. We adjusted for sample differences in age at the interview and control for gender (0 = male, 1 = female).

Analytic Strategy

To test mediation longitudinally, we employed latent growth curve mediation models (MacKinnon, 2008). These models combine latent growth curve modeling with simultaneous equation modeling and are advised when longitudinal data to assess individual trajectories include more than two time points and individual change over time is expected (Selig & Preacher, 2009; Von Soest & Hagtvet, 2011). The growth parameters of the latent growth models are the intercepts (or level of functioning) and slopes (or change over time) which are represented as latent variables. In particular, we test two sets of equations. One set examines the significance of the paths from the initial level of functioning (intercept) of instrumental or emotional support through the initial level of one of the three mediators (physical activity, depressive symptoms, or chronic diseases) to the initial level of functional capacity, and one set to test the same paths but through the changes (slopes) in each variable. The loadings of the slopes are constrained to 0, 3, 6, and 9, such that the slopes represent the yearly rate of change. All models are controlled for gender and baseline age. In Figure 1, we have depicted the full conceptual model.

The estimated paths of the latent growth curve mediation models show whether levels of social support are associated with levels in functional capacity, through the level of the mediator (physical activity, depressive symptoms or number of chronic diseases), and whether changes in social support are associated with changes in functional capacity, through changes in the mediators. The mediation models were estimated in several steps. The first step was separately evaluating the measurement models for each independent variable, each mediator and dependent variable. If a good model fit was observed for the measurement models, we estimated the paths between the intercepts of the independents and the intercepts of the outcome, and we estimated the paths between the slopes of the independents and the slopes of the outcomes. Second, we entered each mediator separately into the models to determine the indirect effects. A comparative fit index (CFI) of 0.95 or higher and a root mean square error of approximation (RMSEA) of 0.08 or lower was indicative of a good model fit. An effect (direct or indirect) was judged to be significant if the 95% bias-corrected confidence intervals (CIs) did not contain zero. As CIs in mediation models are likely to be imbalanced, leading to biased results (MacKinnon, Lockwood, & Williams, 2004), we applied bootstrapping, based on 5,000 bootstrap samples,

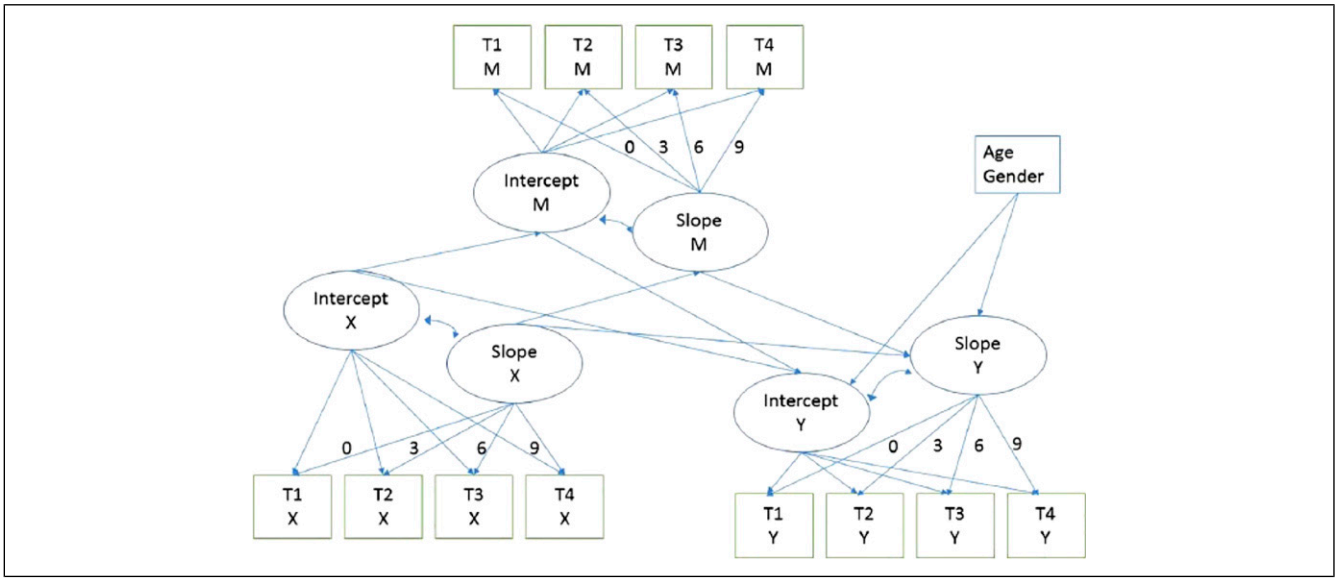

Figure 1. Conceptual model (latent growth mediation model).
Note. The curved two headed arrows indicate that residuals may be correlated. M = number of chronic disease, physical activity, or depressive symptoms; X = emotional or instrumental support; and y = functional capacities.

which is suggested to be the most powerful method to obtain precise estimations of the standard errors and, hence, the CIs of the indirect effects (Preacher & Hayes, 2008). Note that latent growth curve models do not account for attrition due to either mortality or otherwise by itself. We used the maximum likelihood estimator provided by MPlus to estimate missing values based on all available data. There is no evidence of multicollinearity in our analyses as all bivariate correlations between the mediators were below 0.60 (Grewal, Cote, & Baumgartner, 2004).

Results

In Table 1, the descriptive statistics of the dependent, independent, and mediating variables at the four observations are presented. The sample has a fairly high functional capacity on average, although it decreases slightly across the four observations. On average, respondents received intermediate levels of emotional support and instrumental support, and, as indicated by the standard deviations, there was substantial variation in the emotional and instrumental support received. Received emotional and instrumental support increased slightly across the four observations. Respondents, on average, engaged in limited physical activity, scored relatively low on depressive symptoms, and reported about one to one and a half chronic diseases.

We hypothesized that receiving more social support is associated with higher initial levels of functional capacity (intercept effect) and that changes in social support are associated with changes in functional capacity (slope effect). We further hypothesized that associations between initial levels of social support and functional capacity are partly mediated by the initial levels of the mediators and that associations between the changes in social support and changes in functional capacity are partly mediated by changes in the mediators. All models that we ran to test these hypotheses fit the data well, except the model including emotional support, physical activity, and functional capacity. An inspection of the parameters revealed that the associations between the slopes of the three variables were larger than theoretically possible (betas larger than 1). To solve this problem, we adjusted the effects from these slopes to zero, resulting in a moderate fit of the model.

Emotional Support

Table 2 shows the results of the three latent growth mediation models for received emotional support. The initial level of emotional support is not associated with the initial level of functional capacity ($B = .01$, all CI's include zero), nor do we find support for an association between changes in emotional support with changes in functional capacity as this parameter was set to zero to obtain moderate fit. Hypothesis 1A is thus not supported by the data. The initial level of and changes in the mediators (number of chronic diseases, physical activities, and depressive symptoms) significantly relate to the initial level of and changes in functional capacity. Paths from the initial level of emotional support to the initial levels of the mediators and paths from changes in emotional support to changes in the mediators do not reach significance, except for a significant effect from the initial level of emotional support on the initial level of depressive symptoms. Consequently, only the indirect path from the initial level of emotional support, via the initial level of depressive symptoms, to the initial level of functional capacity is significant ($B = .04$, $p < .01$). This finding is in line with Hypothesis 3A. No support for indirect intercept or slope effects via physical activity and chronic diseases are found. There are direct paths from the age and gender to functional capacity in all three mediation models: Being older and being female are related to lower initial levels of functional capacity (intercept effect).

Instrumental Support

Table 3 displays the results of the three latent growth mediation models for received instrumental support. The initial levels of instrumental support are negatively associated with the initial levels of functional capacity, indicating that receiving a higher level of instrumental support is associated with a lower level of functional capacity ($B = -.11$, $p<.01$).

Table 1. Descriptive Statistics of the Dependent, Independent, Mediating and Control Variables According to Observation.

		T_1 (N = 954)		T_2 (N = 561)		T_3 (N = 321)		T_4 (N = 174)	
		M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
1.	Functional capacity (11-30)	25.66	5.26	24.88	5.28	24.15	5.71	23.81	5.54
2.	Total received emotional support (0-36)	20.08	8.79	19.53	8.08	19.79	8.19	20.98	7.84
3.	Total received instrumental support (0-36)	14.12	7.24	15.05	6.70	15.30	7.26	16.36	7.09
4.	Physical activity (0-11 hr)	2.38	1.65	2.14	1.47	2.11	1.47	1.99	1.49
5.	Depressive symptoms (0-47)	8.44	7.55	9.36	8.17	9.72	7.32	11.17	7.45
6.	Chronic diseases (0-6)	1.22	1.12	1.45	1.17	1.59	1.19	1.52	1.08
7.	Age at baseline (75-94 years)	79.91	2.88						
8.	Female	49.3%		51.7%		53.9%		55.1%	

$^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$.

Table 2. Results of the Latent Growth Mediation Models of Emotional Support on Functional Capacity (*N* Respondents = 954).

	Mediators											
	Physical activity				Depressive symptoms				Chronic diseases			
			95% CI of *B*				95% CI of *B*				95% CI of *B*	
	B	*p*	LL	UL	*B*	*p*	LL	UL	*B*	*p*	LL	UL
Control variables												
Age on intercept ADL	−0.20	***	−0.30	−0.09	−0.23	***	−0.34	−0.13	−0.29	***	−0.39	−0.20
Age on slope ADL	−0.02		−0.04	0.00	−0.02		−0.05	0.00	−0.02		−0.05	0.00
Gender (1 = female) on intercept ADL	−3.82	***	−4.40	−3.20	−2.50	***	−3.10	−1.88	−3.00	***	−3.58	−2.43
Gender (1 = female) on slope ADL	0.03		−0.09	0.17	0.09		−0.04	0.22	0.06		−0.07	0.18
Direct effects of the intercepts												
Emotional support on ADL	0.01		−0.08	0.07	−0.02		−0.11	0.04	0.03		−0.04	−0.10
Emotional support on mediator	0.02		0.00	0.04	−0.12	*	−0.26	−0.02	0.01		−0.01	0.02
Mediator on ADL	2.03	***	1.58	2.60	−0.32	***	−0.39	−0.25	−2.00	***	−2.31	−1.69
Direct effects of the slopes												
Emotional support on ADL	[a]				−0.28		−3.71	1.54	0.03		−1.15	1.75
Emotional support on mediator	[a]				−0.14		−1.43	1.76	0.07		0.07	0.33
Mediator on ADL	6.51	**	2.16	18.56	−0.63	***	−2.82	−0.20	−2.67	*	−5.58	−0.86
Indirect effects												
Intercepts: Emotional Support -> Mediator -> ADL	0.04	**	0.00	0.08	0.04	***	0.01	0.09	−0.01		−0.04	0.02
Slopes: Emotional Support -> Mediator -> ADL	[a]				0.09		−1.31	2.56	−0.18		−1.30	0.21
Fit statistics												
χ^2 (*df*)	181.4	(80)			186.1	(78)			169.2	(78)		
RMSEA	0.04				0.04				0.04			
CFI	0.94				0.95				0.97			
SRMR	0.07				0.07				0.07			

Note. CI = confidence interval; LL = lower limit; UL = upper limit; ADL = functional capacity; RMSEA = root mean square error of approximation; CFI = comparative fit index; SRMR = standardized root mean square residual.
[a]Path fixed to zero.
*p < .05. **p < .01. ***p < .001.

Changes in received instrumental support are not associated with changes in functional capacity (B = −.23, all CI's include zero). Hypothesis 1B is thus only supported for the initial levels of instrumental support. Although both the initial levels and changes in physical activity, depressive symptoms, and chronic diseases are positively associated with better initial levels of and changes in functional capacity, no such associations exist between initial levels and changes instrumental support and the initial levels and changes in the mediators. Hence, none of the indirect paths are significant, refuting Hypotheses 2, 3, and 4B. The effects of age and gender are similar to those found in the model estimating received emotional support, that is, older age and being female are associated with lower functional capacity initially.

Additional models were estimated to determine whether the effects remain if we additionally control for potential confounding effects of partner status, educational level, and household income. We found that including these covariates did not attenuate the estimated direct and indirect effects between the independent, mediating, and outcome variables, nor did they improve the model fit (RSMEAs of models including these covariates range between 0.03 and 0.04, the CFIs range between 0.95 and 0.98). Keeping with the principle of parsimony, we therefore only present the original models.

Reversed Pathways?

Competing directionalities in the social support–functional capacity link cannot be ruled out beforehand. For example, an increase in the number of supporters in networks of older adults in poor health has been documented previously, that is, the mobilization of helpers (Van Tilburg, 1998). Latent growth mediation models can only estimate one direction per model (Kline, 2011). Therefore, we estimated latent growth mediation models with reversed pathways. By comparing the model fit, we can suggest which directionality fits our data best. The models with reversed pathways had a much poorer fit than the original models. Of all the models, only those including depressive symptoms as a mediator between functional capacity and the two types of social support have a good model fit. In these models, a lower initial level of

Table 3. Results of the Latent Growth Mediation Models of Instrumental Support on Functional Capacity (*N* Respondents = 954).

Mediators	Physical activity				Depressive symptoms				Chronic diseases			
			95% CI of *B*				95% CI of *B*				95% CI of *B*	
	B	*p*	LL	UL	*B*	*p*	LL	UL	*B*	*p*	LL	UL
Control variables												
Age on intercept ADL	−0.20	***	−0.31	−0.10	−0.23	***	−0.33	−0.13	−0.30	***	−0.39	−0.20
Age on slope ADL	−0.02		−0.04	0.00	−0.02		−0.05	0.00	−0.02		−0.05	0.00
Gender (1 = female) on intercept ADL	−3.75	***	−4.36	−3.14	−2.43	***	−3.03	−1.83	−2.92	***	−3.49	−2.35
Gender (1 = female) on slope ADL	0.03		−0.09	0.17	0.09		0.04	0.21	0.06		−0.07	0.18
Direct effects of the intercepts												
Instrumental support on ADL	−0.11	**	−0.21	−0.03	−0.16	***	−0.26	−0.08	−0.12	**	−0.20	−0.04
Instrumental support on mediator	−0.01		−0.03	0.02	−0.08		−0.21	0.05	0.01		−0.01	0.03
Mediator on ADL	2.00	***	1.55	2.55	−0.32	***	−0.40	−0.25	−1.97	***	−2.28	−1.67
Direct effects of the slopes												
Instrumental support on ADL	−0.23		−2.69	1.65	−0.27		−2.34	0.98	−0.18		−1.92	0.75
Instrumental support on mediator	−0.02		−0.36	0.20	0.24		−0.96	1.48	0.08		−0.06	0.38
Mediator on ADL	6.36	**	1.99	17.74	−0.58	*	−2.47	−0.09	−2.44	*	−4.89	−0.59
Indirect effects												
Intercepts: Instrumental Support -> Mediator -> ADL	−0.01		−0.07	0.04	0.02		−0.02	0.07	−0.02		−0.07	0.04
Slopes: Instrumental Support -> Mediator -> ADL	−0.15		−2.25	1.30	−0.14		−1.48	0.71	−0.15		−2.25	1.30
Fit statistics												
χ^2 (*df*)	147.0	(78)			155.5	(78)			134.7	(78)		
RMSEA	0.03				0.03				0.03			
CFI	0.96				0.96				0.98			
SRMR	0.06				0.07				0.06			

Note. CI = confidence interval; LL = lower limit; UL = upper limit; ADL = functional capacity; RMSEA = root mean square error of approximation; CFI = comparative fit index; SRMR = standardized root mean square residual.
$^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$.

functional capacity relates to more depressive symptoms. More depressive symptoms are associated with more emotional and instrumental support received. Lower functional capacity also directly relates to initially receiving more instrumental support. Concerning associations between the slopes, we observe that a decline in functional capacity relates to an increase in depressive symptoms in both models. No other slope-associations are significant.

Discussion

In the current study, we aimed to determine whether social support relates to functional capacity in old age through three pathways: physical activity, depressive symptoms, and chronic diseases. We did not find any support for the Hypothesis 1A, because initial levels and changes in emotional support do not influence initial levels and changes in functional capacity. We find partial support for Hypothesis 1B, as receiving more instrumental support is associated with lower functional capacity, but only for the intercepts and not for the slopes. That emotional support does not influence functional capacity, also over time, shows that emotional support cannot help people to cope better with problems in performing ADLs. Our finding that receiving more instrumental support at the intercept is related to lower functional capacity is in line with earlier studies on social support and functional capacity (Mendes de Leon et al., 2001; Seeman et al., 1996). However, as only initial levels of instrumental support, not changes, are significantly associated with initial levels of functional capacity, this research does not indicate that increasing instrumental support across old age results in a decline in functional capacity. The finding thus argues against the idea that feelings of dependence can either make people rate their abilities more negatively over time or decrease their actual abilities further by learned helplessness. Instead, it lends more support to the idea that those who received more instrumental support at the outset of the study already had a greater need for instrumental support.

Of the three pathways in the social support–functional capacity link that we investigated, physical activity, depressive symptoms, and chronic diseases, we found that only one pathway was significant: Higher initial levels of

emotional support relate to lower initial levels of depressive symptoms, which relate to higher initial levels of functional capacity. Hypothesis 3A is thus supported for the intercept only. The indirect intercept effect of depressive symptoms is in line with earlier findings that receiving more emotional support is associated with fewer depressive symptoms (Cornwell & Waite, 2009; Reinhardt et al., 2006) and that fewer depressive symptoms are associated with better functional capacity (Carbonare et al., 2009; Penninx, Leveille, et al., 1999). The reassurance and courtesy that is often implicit in emotional support can thus help people to feel better about themselves and their abilities to engage in ADLs.

No indirect intercept or slope effects via physical activity and chronic diseases were found, neither for instrumental nor emotional support. An explanation for the unexpected absence of a link between emotional support and physical activity could be that we used a broad measure of received emotional support and not one that specifically enquired about support for physical activity or other health behaviors. That we also found no association between received instrumental support and physical activity suggests that older adults who rely more on others do not necessarily abstain from physical activity. Contrary to our expectations, we also found no effect of either emotional or instrumental support on chronic diseases. It is known that chronic diseases, such as arthritis, diabetes, chronic obstructive pulmonary disease, and coronary heart disease are already prevalent at substantial rates in the 15 to 65 age group (National Institute for Public Health and Environment, 2018). Processes may have occurred in earlier life stages, not captured by the data of the current study.

Our findings also suggest that changes in more proximal predictors of functional capacity still have a substantial impact on changes in functional capacity in old age. An increase in physical activity, fewer depressive symptoms, and decreased chronic diseases do result in better functional capacity over time. Physical activity can thus slow the disablement process, probably by making older adults use their capacities more often. Reducing depressive symptoms is also beneficial to functional capacity, suggesting that part of a lower functional capacity rating might be due to depressed people underestimating their actual abilities (Alschuler, Theisen-Goodvich, Haig, & Geisser, 2008) paying less attention to medical issues (Penninx, Leveille, et al., 1999), or that decreased depressive symptoms going hand in hand with improved energy balance and reduced somatic symptoms. We would also like to note that the effects of social support tend to differ strongly between health outcomes, so findings on the social support–functional capacity link cannot simply be generalized to other health outcomes.

We would like to draw attention to some limitations of our study. First, the current study relies on self-reports for all variables rather than objective measurements, such as those from accelerometers. Although one could argue that people's own perceptions are most vital to their behaviors and well-being, it would be useful to include more objective measures in future studies linking social support to health. Second, we were not able to study the two directional paths concurrently. Nevertheless, due to our longitudinal design and the modeling techniques employed, we were better able to separate the two directionalities than previous cross-sectional studies have. Third, due to the LASA network delineation, we were unable to consider social support received from network members below the age of 18, limiting, for example, the degree to which we could capture intergenerational support from grandchildren. Previous research indicated that intergenerational contact and assistance is vital for the emotional well-being of older grandparents (e.g., Drew & Silverstein, 2007). Fourth, our emotional support measure captures a core aspect, but not the entire concept of emotional support, as it enquires about discussing feelings and experiences only. Fifth, although outside the scope of the current study that focuses on informal sources of support, future studies could determine how privately paid help influences the receipt of social support and functional capacity over time. Finally, attrition due to mortality is high, which is not surprising given that the sample is above the age of 75. Attrition analyses showed that those who drop out of the study for mortality and other reasons have a lower functional capacity at the preceding observation compared with those who do have follow-up data. In other words, those who score lower on the dependent variable are more likely to drop out of the study at subsequent observations. Thus, the effect of social support on functional capacity found in the current study could be attenuated.

We found that changes in social support do not influence changes in functional capacity in old age, but changes in physical activity, depressive symptoms, and chronic diseases do. Interventions that aim to improve functional capacity or slow the disablement process should thus focus on increasing physical activity, reducing depressive symptoms, and offsetting potential negative consequences of chronic diseases, rather than on increasing the received social support from the network. This is not to say that receiving more emotional support does not hold other benefits, for example, fewer depressive symptoms. Rather, social support is inconsequential for functional capacity in old age compared with the more proximal indicators. Findings also imply that limiting instrumental support to older adults in need out of fear that they will lose their autonomy and incentive to engage in activities is not fruitful. Giving people more instrumental support over time as their need becomes greater does not undermine functional capacity according to the results of the present study.

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